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Towards a Minimum Meat Weight Regulation for the Inshore Sea Scallop (Placopecten magellanicus) Fishery

by

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[1]La présente série documente les bases scientifiques des évaluations des ressources halieutiques sur la côte atlantique du Canada. Elle traite des problèmes courants selon les échéanciers dictés. Les documents qu'elle contient ne doivent pas être considérés comme des énoncés définitifs sur les sujets traités, mais plutôt comme des rapports d'étape sur les études en cours.

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ABSTRACT

Currently, the minimum size of sea scallop landed in the inshore scallop fishery is determined by gear ring size, meat count and minimum shell height. Minimum shell height enforcement requires boarding vessels at sea, as the scallop are not landed in their shells, and the meats are processed at sea. A request for a minimum meat weight to correspond to a minimum shell height was made. The appropriate meat weight would be 4.0 g. This weight corresponds to the meat weight from a 76 mm shell height scallop collected in August from the outside zone off Digby, N.S.

RÉSUMÉ

À l'heure actuelle, dans la pêche côtière du pétoncle, la taille minimale du pétoncle géant débarqué est déterminée par la grosseur des anneaux de l'engin de pêche, par le compte de chairs et par la hauteur minimale de la coquille. L'application des dispositions sur la hauteur minimale de la coquille oblige à des inspections à bord des bateaux, le pétoncle étant décoquillé avant le débarquement et les chairs transformées en mer. On nous a demandé d'établir un poids minimal de la chair qui correspondrait à la hauteur minimale de la coquille. Nous avons déterminé que ce poids serait de 4 g. Il correspond au poids de la chair d'une coquille de 76 mm de hauteur récoltée en août à la limite extérieure de la zone de pêche située au large de Digby (N.-É.).

INTRODUCTION

At present the size of scallops landed in the Bay of Fundy are controlled by gear ring size, meat count and minimum shell height regulations. In February 1993, an Inshore Scallop Workshop was held in Halifax to develop a management plan for the inshore scallop fishery. Scientific advice was requested regarding a minimum meat weight to correspond to the minimum shell height regulation currently in place.

At present sea scallops must be larger than 75 mm in shell height (the largest dimension from the umbo to the valve periphery) when legally landed. However the scallops are processed at sea and the shells are discarded. Shell stocking at sea is infrequent due to the volume occupied by whole animals and a fear of spoilage. These practices render the minimum shell size regulation impossible to enforce without boarding vessels at sea. Even if small shells are found on board a vessel, it is difficult to prosecute for a shell height violation unless intent to return the animals to the sea can be disproven. Conversely, if a minimum meat weight could be attached to this shell height, a size regulation could readily be enforced through sampling the catch at the port of landing. However, for a meat weight regulation to be practical to the fishermen, it is important that it can be reliably correlated to shell height as this is the only visible indicator of meat size prior to sacrificing the animal.

METHODS

In order to provide a minimum meat weight which would correspond to the legal shell height, it is only necessary to define the shell height/meat weight regressions from the poorer growth areas. One approach would be to obtain a sample of 76 mm shells from the various fishing grounds and calculate the sample mean and variance. However, with the data currently available we are only able to derive estimates of meat weight from regressions of shell height on meat weight. Such an approach does not allow for mean and variance estimates.

Data have been collected from throughout the Bay of Fundy from departmental surveys and commercial vessels from approximately 11000 animals for the period 1982-1989. However, we only have access to the regression equations from this data, on a tow by tow basis. The slope of these regressions is dependent on the shell height range of the data (i.e. a sample consisting of only large animals would give a steeper slope than one calculated over a wider size range). In addition data is available specifically from the beds below Brier Island , above Lurcher Shoals and the more distant fishing grounds off Digby, which are known to have a lower growth rate than the inside zone off Digby. In August 1992, 288 animals were randomly sampled off Digby Gut. Regression equations were derived for each of the inside and outside areas. The meat weights for the minimum shell height of 76 mm were then derived from the regression. Similarly, samples were obtained from each of the two beds below Brier Island during annual stock assessment surveys during August of 1991 and 1992 (Kenchington and Lundy 1992). Meat weight is at a minimum for a standard shell height in this month (Kenchington and Lundy in prep.).

RESULTS AND DISCUSSION

Individual sample regressions of the shell height on meat weight produced from data collected from 1982-1989 estimated a mean size of 4.55 g ± 1.05 g corresponding to a 76 mm shell height. The range was 2.6 - 10.7 g, however the 2.6 g was obtained from a regression derived from large animals. Similar values were obtained for the bed below Brier Island (4.7 g) and above Lurcher Shoal (4.6 g)(Fig.1). The Digby fishing grounds are known to be more productive closer to shore and this is reflected in Fig. 2. The meat weight estimate for the 6-10 mile distant beds is 4.1 g. Inshore the estimate is 5.1 g for the 76 mm shell height.

A minimum meat weight of 4.0 g corresponds approximately to a shell height of 76 mm in the areas of slower growth and is recommended as a meat weight equivalent to the minimum shell height regulation. This estimate is rounded down from the regression point estimate (4.1 g) in order to render it more practical to regulate.

REFERENCES

Kenchington, E. and M.J. Lundy. 1992. Brier Island revisited: A 1991 scallop stock status report. CAFSAC Res. Doc 92/42, 15pp.

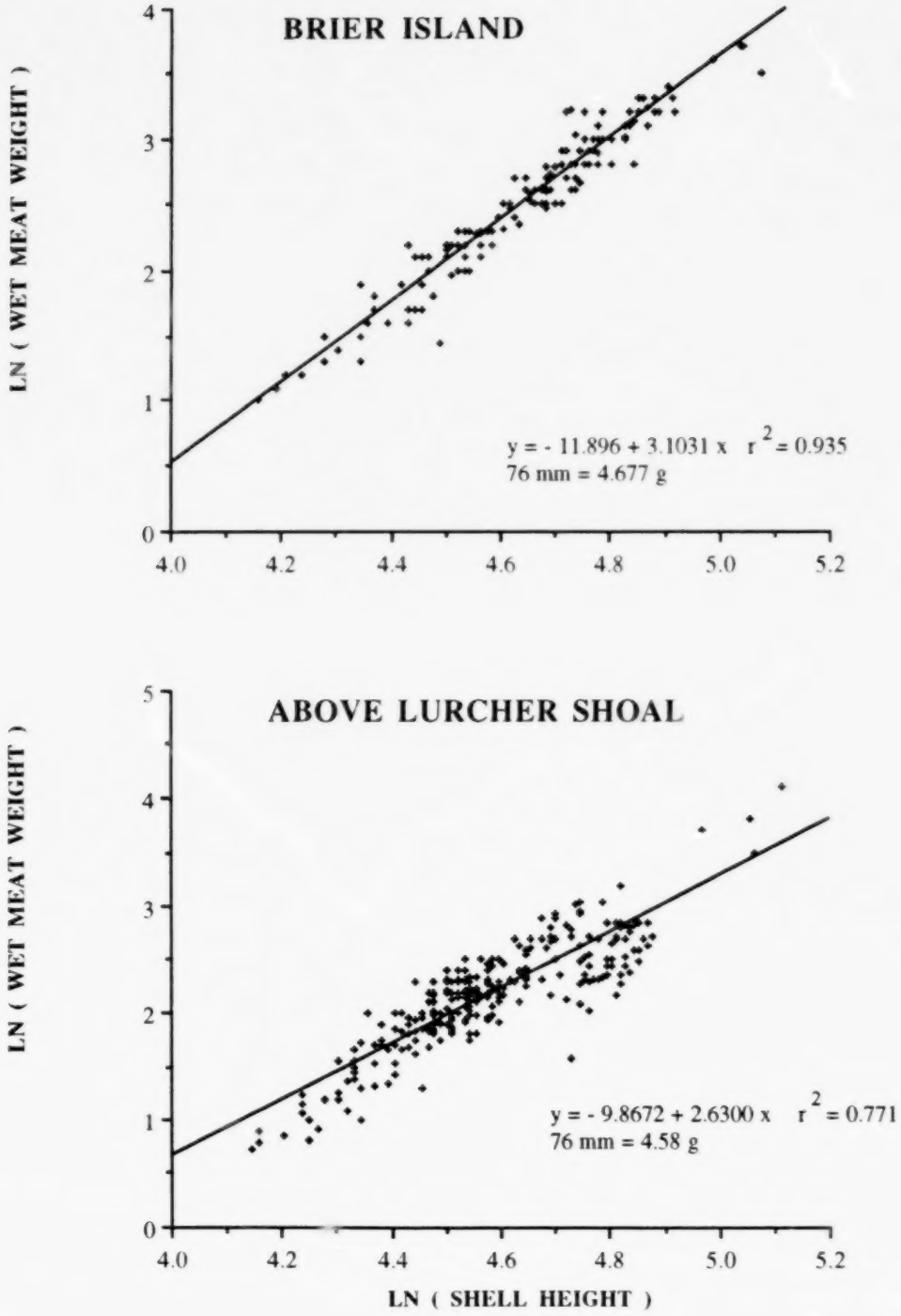
BRIER ISLAND
LN (WET MEAT WEIGHT)
y = - 11.896 + 3.1031 x r 2 = 0.935
76 mm = 4.677 g
ABOVE LURCHER SHOAL
LN (WET MEAT WEIGHT)
y = - 9.8672 + 2.6300 x r 2 = 0.771
76 mm = 4.58 g
LN (SHELL HEIGHT)

Fig. 1. Regressions of shell height against meat weight for the two fishing grounds below Brier Island.

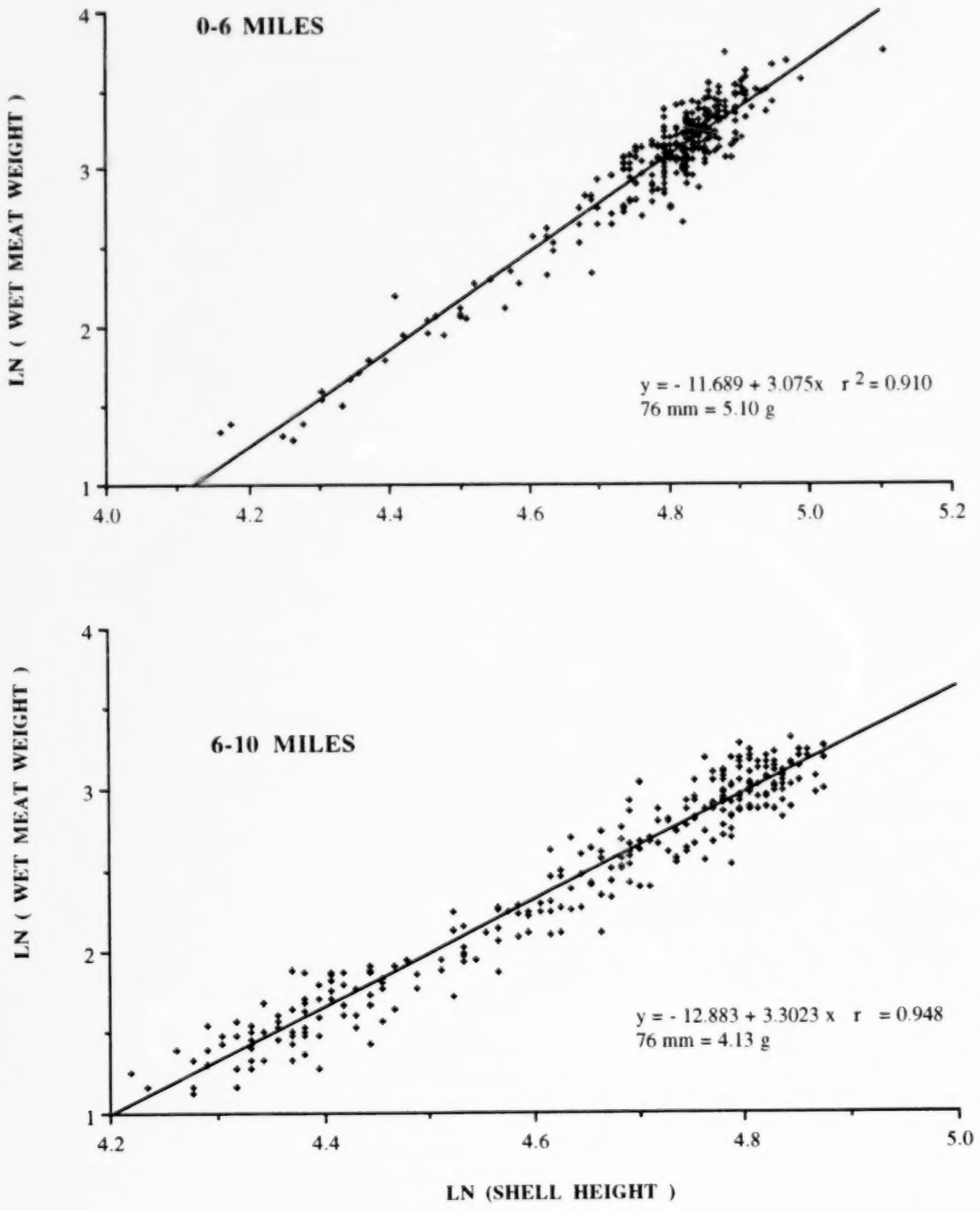
0-6 MILES
LN (WET MEAT WEIGHT)
y = - 11.689 + 3.075x r 2 = 0.910
76 mm = 5.10 g
6-10 MILES
LN (WET MEAT WEIGHT)
y = - 12.883 + 3.3023 x r = 0.948
76 mm = 4.13 g
LN (SHELL HEIGHT)

Fig. 2. Regressions of shell height against meat weight for the inshore and offshore scallop grounds off Digby, N.S. Samples (n=288) were collected in August, 1992.